

WHAT IS CLAIMED IS:

1. A substrate in an integrated circuit (IC) package, comprising:
a first surface that has a central opening,
wherein said central opening has an edge,
wherein said edge includes at least one protruding edge portion that
extends into said central opening.
2. The substrate of claim 1, wherein the substrate is capable of being
coupled to a surface of a stiffener that has a central ground ring, wherein said
at least one protruding edge portion is configured to extend across a portion of the
central ground ring when the substrate is coupled to the stiffener surface.
3. The substrate of claim 1, wherein said central opening is
substantially rectangular.
4. The substrate of claim 1, wherein the IC package is a ball grid
array package.
5. The substrate of claim 1, wherein said at least one protruding edge
portion is tab-shaped.
6. The substrate of claim 1, further comprising a trace on said first
surface corresponding to said at least one protruding edge portion, wherein said
trace extends into said at least one protruding edge portion.
7. The substrate of claim 6, wherein said at least one protruding edge
portion is configured to allow a wire to couple an IC die to said trace.
8. A substrate in an integrated circuit (IC) package, comprising:

a first surface that has a central opening,
wherein said central opening has an edge,
wherein said edge includes at least one recessed edge portion.

9. The substrate of claim 8, wherein the substrate is capable of being coupled to a surface of a stiffener that has a central ground ring, wherein said at least one recessed edge portion is configured to expose a portion of the central ground ring when the substrate is coupled to the stiffener surface.

10. The substrate of claim 9, wherein said at least one recessed edge portion is configured to allow a corresponding ground wire to couple an IC die mounted on said surface of said stiffener to said central ground ring.

11. The substrate of claim 8, wherein said central opening is substantially rectangular.

12. The substrate of claim 8, wherein the IC package is a ball grid array package.

13. A substrate in an integrated circuit (IC) package, comprising:
a first surface that has a central opening,
wherein said central opening has an edge,
wherein said first surface includes at least one hole proximate to said edge.

14. The substrate of claim 13, wherein the substrate is capable of being coupled to a surface of a stiffener that has a central ground ring, wherein said at least one hole is configured to expose a portion of the central ground ring when the substrate is coupled to the stiffener surface.

15. The substrate of claim 14, wherein said at least hole is configured to allow a corresponding ground wire to couple an IC die mounted on said surface of said stiffener to the exposed portion of the central ground ring.

16. The substrate of claim 13, wherein said central opening is substantially rectangular.

17. The substrate of claim 13, wherein the IC package is a ball grid array package.

18. A substrate in an integrated circuit (IC) package, comprising:
a surface that has a central opening, wherein said central opening has an edge;

at least one trace on said surface proximate to said edge;

wherein said substrate is capable of being coupled to a surface of a stiffener that has a central ground ring, wherein said edge is configured to cover a portion of the central ground ring when the substrate is coupled to said surface of said stiffener.

19. The substrate of claim 18, wherein said edge is configured to allow a wire to couple an IC die to said at least one trace.

20. The substrate of claim 18, wherein said central opening is substantially rectangular.

21. The substrate of claim 18, wherein the IC package is a ball grid array package.

22. An integrated circuit (IC) package, comprising:

a substrate that has a first surface, wherein said first surface has a central opening;

a stiffener that has a first surface, wherein said first surface of said stiffener has a central ground ring, wherein said first surface of said stiffener is attached to said substrate;

wherein said central opening has an edge, wherein said edge includes at least one of:

(a) a protruding edge portion that extends across at least a portion of said central ground ring,

(b) a recessed edge portion that exposes a portion of said central ground ring, or

(c) a hole proximate to said edge, wherein the hole exposes a portion of said central ground ring.

23. The IC package of claim 22, wherein said central opening is substantially rectangular.

24. The IC package of claim 22, wherein the IC package is a ball grid array package.

25. The IC package of claim 22, wherein said first surface of said stiffener has a central cavity that coincides with said central opening of said substrate, wherein said central ground ring surrounds said central cavity.

26. The IC package of claim 25, wherein an IC die is attached to said first surface of said stiffener in said central cavity.

27. The IC package of claim 22, wherein an IC die is attached to said first surface of said stiffener within said central opening of said first surface of said substrate.

28. A method of forming a substrate for an integrated circuit (IC) package, comprising the steps of:

- (1) forming a central opening in a substrate, wherein the central opening has an edge; and
- (2) forming the edge to include at least one of:
 - (a) a protruding edge portion that extends into the central opening,
 - (b) a recessed edge portion, or
 - (c) a hole through the substrate proximate to the edge.

29. The method of claim 28, wherein step (1) includes the step of: forming the central opening in the substrate to be a substantially rectangular shape.

30. The method of claim 28, wherein step (1) and step (2) are performed in a single step.